

What is claimed is:

1. A method of providing network access across a shared communications medium between competing users pursuant to service level agreements (SLAs) of the users, comprising the steps of:

- 5 (a) monitoring network access usage by each user during a time interval;
- (b) comparing said monitored network access usage by each user with a predetermined threshold value; and
- (c) soliciting a user to modify the user's SLA if the user's monitored network access usage varies from the predetermined value by a predetermined tolerance.

- 10 2. The method of claim 1, wherein the threshold value represents a respective maximum level of network access for each user.

3. The method of claim 1, wherein the threshold value represents a respective maximum burstable level of network access with target probability for each user.

- 15 4. The method of claim 1, wherein said step of soliciting a user comprises contacting the user via email.

5. The method of claim 1, wherein said step of soliciting a user comprises contacting the user via instant messaging.

6. The method of claim 1, wherein said step of soliciting a user comprises contacting the user via redirection of a web browser of the user to a solicitation web page.

7. The method of claim 1, wherein said step of soliciting a user comprises contacting the user via generation and mailing of literature.

- 20 8. The method of claim 1, wherein said step of soliciting a user comprises contacting the user via a telephonic communication.

9. The method of claim 1, wherein the modification of the user's SLA includes guaranteeing a level of network access to the user on a permanent basis.
10. The method of claim 1, wherein the modification of the user's SLA includes guaranteeing a level of network access to the user with a maximum burstable level of network access with target probability.
11. The method of claim 1, further comprising charging the user a fee for the modification of the SLA.
12. The method of claim 1, wherein the modification of the user's SLA includes guaranteeing a level of network access to the user on a temporary basis.
13. The method of claim 1, wherein network access comprises bandwidth across the shared communications medium for consumption by each user in conveying data of the user.
14. The method of claim 1, wherein said step of monitoring comprises monitoring the bandwidth that is consumed by each user in an upstream direction of communication across the shared communications medium at time intervals of one minute to fifteen minutes.
15. The method of claim 1, wherein said step of monitoring comprises monitoring the bandwidth that is consumed by each user in a downstream direction of communication across the shared communications medium at time intervals of fifteen minutes to sixty minutes.
16. The method of claim 1, wherein said step of monitoring network access includes collecting data representative of the number of logical data units transmitted from and to each user during a time interval.

17. The method of claim 1, wherein said step of monitoring network access usage includes collecting data representative of the number of bytes and data packets transmitted from and to each user during a time interval.
18. The method of claim 1, wherein said step of monitoring network access usage includes collecting data representative of the number of logical data units of the user that are dropped during a time interval.
19. The method of claim 1, wherein said step of monitoring network access usage includes collecting data representative of the number of bytes and data packets of the user that are dropped during a time interval.
20. The method of claim 1, wherein said step of monitoring network access usage includes collecting data representative of the number of logical data units of the user that are requested to be transmitted in the upstream direction during a time interval.
21. The method of claim 1, wherein the shared communications medium is part of a Shared Access Carrier Network.
22. The method of claim 21, wherein the Shared Access Carrier Network comprises a Cable Network and the shared communications medium comprises a coaxial cable.
23. The method of claim 21, wherein the Shared Access Carrier Network comprises a wireless network.
24. The method of claim 1, further comprising, based on said monitored network access usage, allocating network access to each user for a future time interval.
25. The method of claim 24, wherein said step of allocating network access comprises allocating network access equally to the users.

26. The method of claim 24, further comprising prioritizing the users for allocating network access.

27. The method of claim 26, wherein said step of prioritizing is based on the SLAs of the users, wherein the SLAs specify respective minimum levels of network access for the users, and said step of prioritizing includes comparing said monitored network access usages for the users with the specified respective minimum levels of network access, and awarding priority to a user when said respective monitored network access usage for such user falls below the user's specified respective minimum level of network access.

28. The method of claim 26, wherein said step of prioritizing is based on the SLAs of the users, wherein the SLAs specify respective time-of-day (TOD) minimum levels of network access for users, and said step of prioritizing includes comparing said monitored network access usages for such users during the specified respective TOD with the specified respective TOD minimum levels of network access, and awarding priority to a user when said monitored network access usage during the specified respective TOD for such user falls below the user's specified respective TOD minimum level of network access.

29. The method of claim 26, wherein said step of prioritizing is based on the SLAs of the users, wherein the SLAs specify respective minimum levels of network access up to a maximum burstable levels with target probability for users, and said step of prioritizing includes comparing said monitored network access usage both with the respective minimum levels of network access for such users and with the respective maximum burstable levels of network access for such users, and comparing the instances the respective maximum levels of network access were

obtained for such users out of all instances the respective maximum levels of network access were requested for such users.

30. The method of claim 26, wherein said step of prioritizing is based on the SLAs of the users, wherein the SLAs provide a respective fee for network access usage by users, and said step of prioritizing comprises sorting such users based on each user's respective fee in decreasing order, with a user with a higher fee receiving priority over a user with a lesser fee.

31. The method of claim 26, wherein said step of prioritizing is based on the SLAs of the users, wherein the SLAs provide respective credits for levels of network access below respective guaranteed levels for users, and said step of prioritizing comprises sorting such users based on each user's respective credit in decreasing order, with a user with a higher credit receiving priority over a user with a lower credit.

32. The method of claim 26, wherein said step of prioritizing is based on the SLAs of the users, wherein the SLAs specify respective minimum levels of network access for users, and said step of allocating network access comprises allocating network access to such users equal to each user's specified respective minimum level of network access.

33. The method of claim 26, wherein said prioritizing is based on fairness considerations.

34. The method of claim 33, wherein the users are prioritized based on user throughput during a time interval, with a user with lesser throughput rate receiving priority over a user with greater throughput rate.

35. The method of claim 33, wherein the users are prioritized based on data loss for each user during a time interval, with a user with greater data loss rate having priority over a user with lesser data loss rate.

36. The method of claim 33, wherein the users are prioritized based on network access usage for a particular time of day, with a user with lesser network access usage for the particular time of day receiving priority over a user with greater network access usage for the particular time of day.

37. The method of claim 33, wherein the users are prioritized based on both user throughput and data loss during a time interval.

38. The method of claim 33, wherein users are prioritized based on an established minimum quality of service (QoS) standard.

39. The method of claim 24, further comprising the step of forecasting network access usage by each user during the future time interval based on said step of monitoring network access usage by each user.

40. The method of claim 39, wherein said step of forecasting comprises predicting future network access usage of each user based upon monitored past network access usage patterns of each user.

41. The method of claim 39, wherein said step of forecasting comprises applying an adaptive-response-rate signal exponential smoothing function and a Holt-Winters' seasonal exponential smoothing function to said monitored network access usages of the users.

42. The method of claim 39, wherein said step of allocating comprises allocating network access to the users proportionally based on each user's forecasted network access usage.

43. The method of claim 39, further comprising the step of prioritizing the users for allocating network access.

44. The method of claim 43, wherein said prioritizing is based on each user's forecasted network access usage.

5 45. The method of claim 43, wherein said users are prioritized in increasing order of each user's forecasted network access usage, with a user with a lesser forecasted network access usage receiving priority over a user with a greater forecasted network access usage.

10 46. The method of claim 43, wherein said step of allocating comprises allocating network access to the users equal to each user's forecasted network access usage, and then allocating any remaining network access equally to the users.

15 47. The method of claim 43, wherein said step of allocating network access comprises allocating network access to the users equal to each user's forecasted network access usage, and then allocating any remaining network access to the users proportionally based on each user's forecasted network access usage.

48. A method of providing network access across a shared communications medium between competing users pursuant to service level agreements (SLAs) of the users, comprising the steps of:

20 (a) monitoring network access usage by each user for respective predetermined past time intervals;

(b) identifying a recurrent period of high network access usage of a user based on said monitoring; and

25 (c) soliciting a user to modify the user's SLA to guarantee a minimum level of network access during an anticipated future recurrent period of high network access usage.

49. The method of claim 48, wherein said step of soliciting a user comprises contacting the user via email.

50. The method of claim 48, wherein said step of soliciting a user comprises contacting the user via instant messaging.

5 51. The method of claim 48, wherein said step of soliciting a user comprises contacting the user via redirection of a web browser of the user to a solicitation web page.

52. The method of claim 48, wherein said step of soliciting a user comprises contacting the user via generation and mailing of literature.

10 53. The method of claim 48, wherein said step of soliciting a user comprises contacting the user via a telephonic communication.

54. The method of claim 48, wherein the modification of the user's SLA includes guaranteeing a minimum level of network access to the user for all future recurrent periods of high network access usage.

15 55. The method of claim 55, wherein the modification of the user's SLA includes guaranteeing a minimum level of network access to the user for a predetermined number of future recurrent periods of high network access usage.

20 56. The method of claim 48, wherein the modification of the user's SLA includes guaranteeing a minimum level of network access to the user with a maximum burstable level of network access with target probability for the future period of high network access usage.

57. The method of claim 48, wherein the recurrent time period of high network access usage comprises a particular time of day.

25 58. The method of claim 48, further comprising charging the user a fee for modification of the user's SLA.